ISSN: 3033-3512

Journal of Traditional Medicine and Chinese Medicine

SCIENTIFIC Research and Community

Review Article

Open Access

Quantitative Evidence of Benefit on Longevity from the Traditional Medicine Practice of Lifestyle Management Using Collected Data from Y2014 to Y2022 While Applying the Space-Domain Energy Model of Viscoplastic Medicine Theory Based On Gh-Method: Math-Physical Medicine

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ABSTRACT

Since 2010, the author has practiced the lifestyle of choosing high-quality food from the Mediterranean diet which includes fresh vegetables & fruits, nuts & seeds, fish, and olive oil, while avoiding red meat, processed foods, unhealthy snacks, and sugary food. He also controlled his food portion size around 50% to 75% of his previous food consumption amount prior to Y2010 (as the 100% yardstick). He walks about 7 miles (10 km or 16,000 steps) each day, including 4,000 steps after each meal. In addition, he practices Chinese Tai-chi movement and arms/leg stretching. He maintains 7-8 hours of sleep with minimal interruption, such as nighttime urination. He avoids stressful events or incidents as much as possible and practices meditation but does not take herbs or receive acupuncture, spiritual therapies, etc.

The above descriptions of his daily lifestyle and continuous practices do not cover the entire scope of complementary traditional medicine or alternative medicine, but undeniably such a stringent lifestyle management is a vital part of both modern western medicine and complementary traditional medicine from many other countries in the world. This article discusses specifically the sequential benefits of every single health stage of his life through selected lifestyle management efforts of preventive medicine practice which is surely a vital part of the spirit of both traditional medicine and alternative medicine.

Other than the fundamental genetic factors and certain external environmental factors, when people do not pay attention to their lifestyle details, such as overeating, having a poor diet, lack of exercise, high stress, and sleep loss along with having certain long-term unhealthy habits (cigarettes smoking, alcohol drinking, and illicit drugs use), they are likely to gain body weight as the first sign of their health problems, For most cases, being overweight and having obesity develop into type 2 diabetes conditions. When excessive glucose circulates in the bloodstream, it causes damage to the structural integrity of the arteries and even to some micro-vessels. In addition, high blood pressure (BP) would easily create an artery rupture situation, and high cholesterol would cause an artery blockage situation through plaque buildup. Combining these three biomarkers, glucose, blood pressure, and blood lipids (cholesterol), we could determine the overall risk probability of a chronic disease patient's chance of developing strokes, cardiovascular disease (CVD), or chronic kidney disease (CKD). When combined with long-term unhealthy habits, mainly cigarette smoking, with these 6 poor lifestyle categories, diet, water intake, exercise, sleep, stress, regular life routines (an essential part of all medical fields, whether traditional medicine or western medicine), it would eventually increase the risk of developing certain cancers. These mortality threats, including CVD, Strokes, CKD, and cancers, would count for more than half of total death cases in the US and the world. These metabolic diseases plus immunity-related infectious diseases would count for at least 80% to 85% of total death each year.

Above described medical scenarios are applicable on both modern western medicine and traditional or alternative medicines. After all, for both western medicine and traditional medicine, improving metabolism and strengthening immunity are the basic cornerstones to avoiding ultimate mortality and prolonging the lifespan.

In this article, the author selects the top three influential factors for each of these 5 somewhat related diseases, obesity, diabetes, CVD/Strokes, CKD, and cancers, to investigate and construct the connection diagram or roadmap which is aiming at their impacts on the ultimate goal of expanding lifespan, i.e. longevity.

In addition, he has chosen the space-domain viscoplastic medicine theory (SD-VMT) energy model to calculate individual energies (or degree of influence or degree of contribution) associated with 3 individual input stress components concerning the single output strain. These 6 sets of complicated calculations have utilized the developed VMT module of his Chronic research software on his iPhone device.

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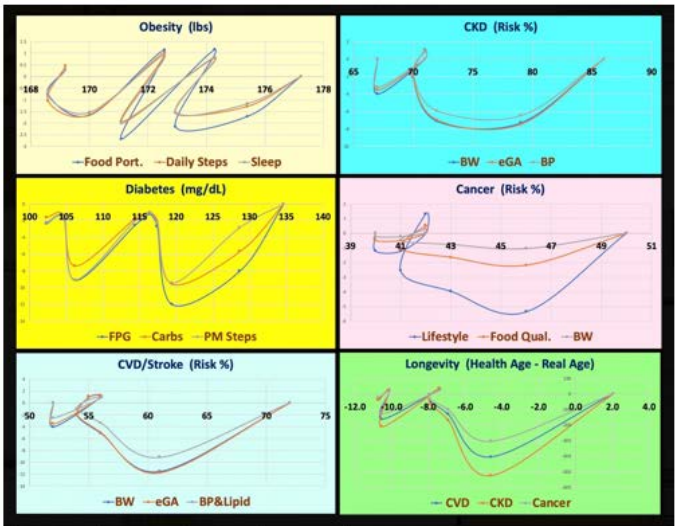
Received: January 28, 2023; **Accepted:** February 07, 2023; **Published:** February 10, 2023

In Summary, There are 6 Conclusions

1. The ranking of influence or contribution on **obesity (output: body weight BW) is food portion 38% > daily walking exercise 32% > sleep 30%**.
2. The ranking of influence or contribution on **type 2 diabetes (output: estimated average glucose or eAG) is FPG 40% > carbs/sugar grams 31% > exercise (post-meal walking steps) 29%**.
3. The ranking of influence or contribution on **the output of risk of developing into cardiovascular diseases (CVD) or strokes is eAG & BW 36% & 36% > average amount of blood pressure and blood lipids 27%**.
4. The ranking of influence or contribution on **the output of developing into chronic kidney disease (CKD) is eAG & BW 35% & 35% > blood pressure 30%**.
5. The ranking of influence or contribution on **the output of risk of developing into a variety of cancers is summarized score of the total 6 lifestyle details 62% > food quality 26% > body weight 12%**.
6. The ranking of influence or contribution on **longevity (estimated health age minus real biological age) is CKD 42% > CVD 33% > Cancers 25%. These 3 percentage rankings reflected the author's personal medical history since his CVD cases had occurred ~10 years earlier than his CKD case and he has had no signs of any cancer yet**.

The different rankings have also matched with conclusions from many published medical papers he has read and learned along with his previous own research work. It has depicted a clear road map starting from lifestyle details, particularly diet and exercise (a vital part of both modern western medicine and complimentary traditional medicine) through both obesity and diabetes, and then traveling through certain mortality diseases, such as CVD/strokes, CKD, and cancers, to the ultimate goal of longevity.

This roadmap reveals that the selection of food consumption by Americans, such as large food portions and poor food quality, would lead to being overweight or obese (about 2/3 of the total US population). Heavy body weight would push fasting plasma glucose (FPG) in the early morning higher than normal which serves as the baseline for postprandial plasma glucose (PPG) in the daytime. When high FPG is combined with high carbs/sugar intake amount and no exercise, PPG would increase and then develop into diabetes. Both obesity and diabetes serve as the foundation for many other life-threatening diseases. When increased body weight and elevated glucose are combined with high blood pressure and high cholesterol, CVD and CKD will occur. Furthermore, different kinds of cancers can develop when genetic factor and certain external environmental factors are included. These 4 complications, CVD, strokes, CKD, and cancers, have occupied more than half of the total death cases annually which would eventually shorten the expected lifespan of patients, i.e. longevity.



Weight	Food Port.	Daily Steps	Sleep	Ranking of Influences
Weight	38%	32%	30%	Food Portion > Exercise > Sleep
Diabetes	FPG	Carbs	PM Steps	
Diabetes	40%	31%	29%	FPG > Carbs > Exercise
CVD	BW	eGA	BP&Lipid	
CVD	36%	36%	27%	eGA & BW > BP & Lipid
CKD	BW	eGA	BP	
CKD	35%	35%	30%	eGA & BW > BP
Cancer	Lifestyle	Food Qual.	BW	
Cancer	62%	26%	12%	Total Lifestyle > Food Quality > Weight
Longevity	CVD	CKD	Cancer	
Longevity	33%	42%	25%	CKD > CVD > Cancers

Introduction

Since 2010, the author has practiced the lifestyle of choosing high-quality food from the Mediterranean diet which includes fresh vegetables & fruits, nuts & seeds, fish, and olive oil, while avoiding red meat, processed foods, unhealthy snacks, and sugary food. He also controlled his food portion size around 50% to 75% of his previous food consumption amount prior to Y2010 (as the 100% yardstick). He walks about 7 miles (10 km or 16,000 steps) each day, including 4,000 steps after each meal. In addition, he practices Chinese Tai-chi movement and arms/leg stretching. He maintains 7-8 hours of sleep with minimal interruption, such as nighttime urination. He avoids stressful events or incidents as much as possible and practices meditation but does not take herbs or receive acupuncture, spiritual therapies, etc.

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Other than the fundamental genetic factors and certain external environmental factors, when people do not pay attention to their lifestyle details, such as overeating, having a poor diet, lack of exercise, high stress, and sleep loss along with having certain long-term unhealthy habits (cigarettes smoking, alcohol drinking, and illicit drugs use), they are likely to gain body weight as the first sign of their health problems, For most cases, being overweight and having obesity develop into type 2 diabetes conditions.

When excessive glucose circulates in the bloodstream, it causes damage to the structural integrity of the arteries and even to some micro-vessels. In addition, high blood pressure (BP) would easily create an artery rupture situation, and high cholesterol would cause an artery blockage situation through plaque buildup. Combining these three biomarkers, glucose, blood pressure, and blood lipids (cholesterol), we could determine the overall risk probability of a chronic disease patient's chance of developing strokes, cardiovascular disease (CVD), or chronic kidney disease (CKD). When combined with long-term unhealthy habits, mainly cigarette smoking, with these 6 poor lifestyle categories, diet, water intake, exercise, sleep, stress, regular life routines (an essential part of all medical fields, whether traditional medicine or western medicine), it would eventually increase the risk of developing certain cancers. These mortality threats, including CVD, Strokes, CKD, and cancers, would count for more than half of total death cases in the US and the world. These metabolic diseases plus immunity-related infectious diseases would count for at least 80% to 85% of total death each year.

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In addition, he has chosen the space-domain viscoplastic medicine theory (SD-VMT) energy model to calculate individual energies (or degree of influence or degree of contribution) associated with 3 individual input stress components concerning the single output strain. These 6 sets of complicated calculations have utilized the developed VMT module of his Chronic research software on his iPhone device.

Methods

MPM Background

To learn more about his developed GH-Method: math-physical medicine (MPM) methodology, readers can read the following three papers selected from his published 760+ papers.

The first paper, No.386 describes his MPM methodology in a general conceptual format [1]. The second paper, No. 387outlines the history of his personalized diabetes research, various application tools, and the differences between biochemical medicine (BCM) approach versus the MPM approach [2]. The third paper, No. 397 depicts a general flow diagram containing ~10 key MPM research methods and different tools [3].

The Author's Diabetes History

The author was a severe T2D patient since 1995. He weighed 220 lb. (100 kg) at that time. By 2010, he still weighed 198 lb. with an average daily glucose of 250 mg/dL (HbA1C at 10%). During that year, his triglycerides reached 1161 (high risk for CVD and stroke) and his albumin-creatinine ratio (ACR) at 116 (high risk for chronic kidney disease). He also suffered from five cardiac episodes within a decade. In 2010, three independent physicians warned him regarding the need for kidney dialysis treatment and the future high risk of dying from his severe diabetic complications.

In 2010, he decided to self-study endocrinology with an emphasis on diabetes and food nutrition. He spent the entire year of 2014 to develop a metabolism index (MI) mathematical model. During 2015 and 2016, he developed four mathematical prediction models related to diabetes conditions: weight, PPG, fasting plasma glucose (FPG), and HbA1C (A1C). Through using his developed mathematical metabolism index (MI) model and the other four glucose prediction tools, by the end of 2016, his weight was reduced from 220 lbs. (100 kg) to 176 lbs. (89 kg), waistline from 44 inches (112 cm) to 33 inches (84 cm), average finger-piercing glucose from 250 mg/dL to 120 mg/dL, and A1C from 10% to ~6.5%. One of his major accomplishments is that he no longer takes any diabetes-related medications since 12/8/2015.

In 2017, he achieved excellent results on all fronts, especially his glucose control. However, during the pre-COVID period, including both 2018 and 2019, he traveled to ~50 international cities to attend 65+ medical conferences and made ~120 oral presentations. This hectic schedule inflicted damage to his diabetes control caused by stress, dining out frequently, post-meal exercise disruption, and jet lag, along with the overall negative metabolic impact from the irregular life patterns; therefore, his glucose control was somewhat affected during the two-year traveling period of 2018-2019.

He started his COVID-19 self-quarantined life on 1/19/2020. By 10/16/2022, his weight was further reduced to ~164 lbs. (BMI 24.22) and his A1C was at 6.0% without any medication intervention or insulin injection. In fact, with the special COVID-19 quarantine lifestyle since early 2020, not only has he written and published ~500 new research articles in various medical and engineering journals, but he has also achieved his best health conditions for the past 27 years. These achievements have resulted from his non-traveling, low-stress, and regular daily life routines. Of course, his in-depth knowledge of chronic diseases, sufficient practical lifestyle management experiences, and his own developed high-tech tools have also contributed to his excellent health improvements.

On 5/5/2018, he applied a continuous glucose monitoring (CGM) sensor device on his upper arm and checks his glucose measurements every 5 minutes for a total of 288 times each day. Furthermore, he extracted the 5-minute intervals from every 15-minute interval for a total of 96 glucose data each day stored in his computer software.

Through the author's medical research work over 40,000 hours and read over 4,000 published medical papers online in the past 13 years, he discovered and became convinced that good life habits of not smoking, moderate or no alcohol intake, avoiding illicit drugs; along with eating the right food with well-balanced nutrition, persistent exercise, having a sufficient and good quality of sleep, reducing all kinds of unnecessary stress, maintaining a regular daily life routine contribute to the risk reduction of having many diseases, including CVD, stroke, kidney problems, micro blood vessels issues, peripheral nervous system problems, and even cancers and dementia. In addition, a long-term healthy lifestyle can even "repair" some damaged internal organs, with different required time-length depending on the particular organ's cell lifespan. For example, he has "self-repaired" about 35% of his damaged pancreatic beta cells during the past 10 years.

Energy Theory

The human body and organs have around 37 trillion live cells which are composed of different organic cells that require energy infusion from glucose carried by red blood cells; and energy consumption from labor-work or exercise. When the residual energy (resulting from the plastic glucose scenario) is stored inside our bodies, it will cause different degrees of damage or influence to many of our internal organs.

According to physics, energies associated with the glucose waves are proportional to the square of the glucose amplitude. The residual energies from elevated glucoses are circulating inside the body via blood vessels which then impact all of the internal organs to cause different degrees of damage or influence, e.g. diabetic complications. Elevated glucose (hyperglycemia) causes damage to the structural integrity of blood vessels. When it combines with both hypertension (rupture of arteries) and hyperlipidemia (blockage of arteries), CVD or Stroke appens. Similarly, many other deadly diseases could result from these excessive energies which would finally shorten our lifespan. For an example, the combination of hyperglycemia and hypertension would cause micro-blood vessel's leakage in kidney systems which is one of the major cause of CKD.

The author then applied Fast Fourier Transform (FFT) operations to convert the input wave from a time domain into a frequency domain. The y-axis amplitude values in the frequency domain indicate the proportional energy levels associated with each different frequency component of input occurrence. Both output symptom value (i.e. strain amplitude in the time domain) and output symptom fluctuation rate (i.e. the strain rate and strain frequency) are influencing the energy level (i.e. the Y-amplitude in the frequency domain).

Currently, many people live a sedentary lifestyle and lack sufficient exercise to burn off the energy influx which causes them to become overweight or obese. Being overweight and having obesity leads to a variety of chronic diseases, particularly diabetes. In addition, many types of processed food add unnecessary ingredients and harmful chemicals that are toxic to the bodies, which lead to the development of many other deadly diseases, such as cancers. For example, ~85% of worldwide diabetes patients are overweight, and ~75% of patients with cardiac illnesses or surgeries have diabetes conditions.

In engineering analysis, when the load is applied to the structure, it bends or twists, i.e. deform; however, when the load is removed, it will either be restored to its original shape (i.e, elastic case) or remain in a deformed shape (i.e. plastic case). In a biomedical system, the glucose level will increase after eating carbohydrates or sugar from food; therefore, the carbohydrates and sugar function as the energy supply. After having labor work or exercise, the glucose level will decrease. As a result, the exercise burns off the energy, which is similar to load removal in the engineering case. In the biomedical case, both processes of energy influx and energy dissipation take some time which is not as simple and quick as the structural load removal in the engineering case. Therefore, the age difference and 3 input behaviors are "dynamic" in nature, i.e. time-dependent. This time-dependent nature leads to a "viscoelastic or viscoplastic" situation. For the author's case, it is "viscoplastic" since most of his biomarkers are continuously improved during the past 13-year time window.

Time-Dependent Output Strain and Stress of (Viscous Input*Output Rate)

Hooke's law of linear elasticity is expressed as: **Strain (ε: epsilon) = Stress (σ: sigma) / Young's modulus (E)**

For biomedical glucose application, his developed linear elastic glucose theory (LEGT) is expressed as: **Ppg (Strain) = Carbs/ Sugar (Stress) * Gh.P-Modulus (A Positive Number) + Post-Meal Walking K-Steps * Gh.W-Modulus (A Negative Number)**

Where GH.p-Modulus is reciprocal of Young's modulus E.
However, in viscoelasticity or viscoplasticity theory, the stress is expressed as:

Stress = Viscosity Factor (H: Eta) *Strain Rate (Dε/Dt)
Where strain is expressed as Greek epsilon or ε.

In this article, in order to construct an "ellipse-like" diagram in a stress-strain space domain (e.g. "hysteresis loop") covering both the positive side and negative side of space, he has modified the definition of strain as follows:

Strain = (Body Weight at Certain Specific Time Instant)
He also calculates his strain rate using the following formula:

Strain Rate = (Body Weight at Next Time Instant) - (Body Weight At Present Time Instant)

The risk probability % of developing into CVD, CKD, Cancer is calculated based on his developed metabolism index model (MI) in 2014. His MI value is calculated using inputs of 4 chronic conditions, i.e. weight, glucose, blood pressure, and lipids; and 6 lifestyle details, i.e. diet, drinking water, exercise, sleep, stress, and daily routines. These 10 metabolism categories further contain ~500 elements with millions of input data collected and processed since 2010. For individual deadly disease risk probability %, his mathematical model contains certain specific weighting factors for simulating certain risk percentages associated with different deadly diseases, such as metabolic disorder-induced CVD, stroke, kidney failure, cancers, dementia; artery damage in heart and brain, micro-vessel damage in kidney, and immunity-related infectious diseases, such as COVID death.

Some of explored deadly diseases and longevity characteristics using the **viscoplastic medicine theory (VMT)** include stress relaxation, creep, hysteresis loop, and material stiffness, damping effect **based on time-dependent stress and strain** which are different from his previous research findings using **linear elastic glucose theory (LEGT)** and **nonlinear plastic glucose theory (NPGT)**.

Citation: Gerald C.Hsu (2023) Quantitative Evidence of Benefit on Longevity from the Traditional Medicine Practice of Lifestyle Management Using Collected Data from Y2014 to Y2022 While Applying the Space-Domain Energy Model of Viscoplastic Medicine Theory Based On Gh-Method: Math-Physical Medicine. Journal of Traditional Medicine and Chinese Medicine. SRC/JTMCM-101. DOI: doi.org/10.47363/JTMCM/2023(1)101

Results

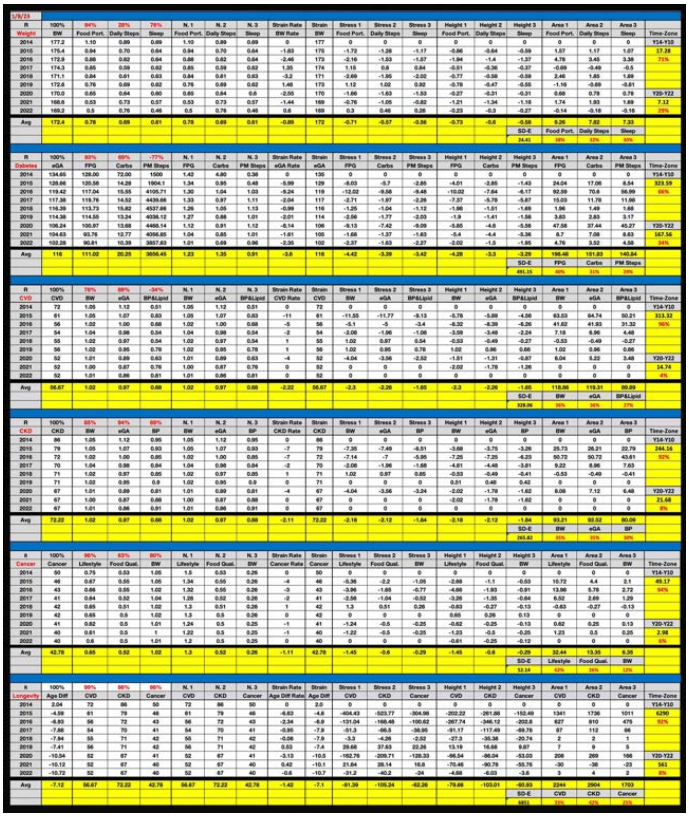

Figure 1: Shows 6 Data Tables

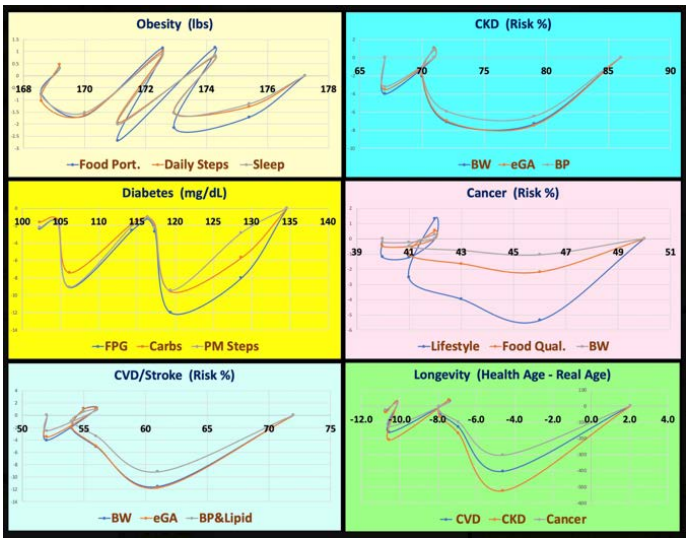

Figure 2: 6 Space-domain Analysis Results

Weight	Food Port.	Daily Steps	Sleep	*Ranking of Influences*
Weight	38%	32%	30%	*Food Portion > Exercise > Sleep*
Diabetes	FPG	Carbs	PM Steps	
Diabetes	40%	31%	29%	*FPG > Carbs > Exercise*
CVD	BW	eGA	BP&Lipid	
CVD	36%	36%	27%	*eGA & BW > BP & Lipid*
CKD	BW	eGA	BP	
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Cancer	Lifestyle	Food Qual.	BW	
Cancer	62%	26%	12%	*Total Lifestyle > Food Quality > Weight*
Longevity	CVD	CKD	Cancer	
Longevity	33%	42%	25%	*CKD > CVD > Cancers*

Figure 3: Conclusion Table

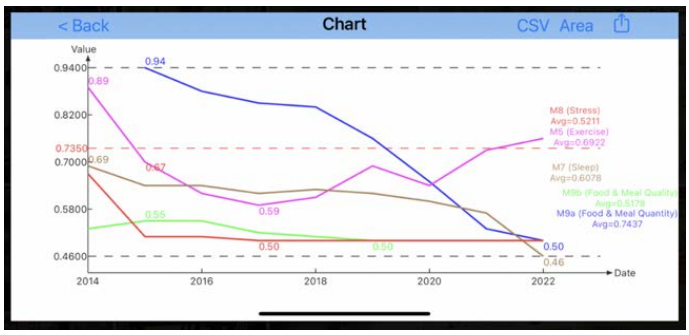

Figure 4: Shows TD Curves of Food Portion (m9a), Food Quality (m9b), Exercise (m5), Sleep (m7), Stress (m8) During Y2014-2022

Conclusions

In summary, there are 6 conclusions

1. The ranking of influence or contribution on obesity (output: body weight BW) is food portion 38% > daily walking exercise 32% > sleep 30%.
2. The ranking of influence or contribution on type 2 diabetes (output: estimated average glucose or eAG) is FPG 40% > carbs/sugar grams 31% > exercise (post-meal walking steps) 29%.
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5. The ranking of influence or contribution on the output of risk of developing into a variety of cancers is summarized score of the total 6 lifestyle details 62% > food quality 26% > body weight 12%.
6. The ranking of influence or contribution on longevity (estimated health age minus real biological age) is CKD 42% > CVD 33% > Cancers 25%. These 3 percentage rankings reflected the author's personal medical history since his CVD cases had occurred ~10 years earlier than his CKD case and he has had no signs of any cancer yet.

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This roadmap reveals that the selection of food consumption by Americans, such as large food portions and poor food quality, would lead to being overweight or obese (about 2/3 of the total US population). Heavy body weight would push fasting plasma glucose (FPG) in the early morning higher than normal which serves as the baseline for postprandial plasma glucose (PPG) in the daytime. When high FPG is combined with high carbs/sugar intake amount and no exercise, PPG would increase and then develop into diabetes. Both obesity and diabetes serve as the foundation for many other life-threatening diseases. When increased body weight and elevated glucose are combined with high blood pressure and high cholesterol, CVD and CKD will

occur. Furthermore, different kinds of cancers can develop when genetic factor and certain external environmental factors are included. These 4 complications, CVD, strokes, CKD, and Cancers, have occupied more than half of the total death cases annually which would eventually shorten the expected lifespan of patients, i.e. longevity.

References

For editing purposes, majority of the references in this paper, which are self-references, have been removed for this article. Only references from other authors' published sources remain. The bibliography of the author's original self-references can be viewed at www.eclairemd.com.

For reading more of the author's published VGT or FD analysis results on medical applications, please locate them through three published special editions from the following three specific journals:

1. F Patrick Robinson, Lauretta T Quinn, James H Rimmer (2016) Effects of High-Intensity Endurance and Resistance Exercise on HIV Metabolic Abnormalities: A Pilot Study 8.
2. Journal of Applied Material Science & Engineering Research (contact: Catherine).
3. Advances in Bioengineering and Biomedical Science Research (contact: Sony Hazi).